



## Impacts of lack of physical activity on the propension to diabetes mellitus type 2: an integrative review

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### Introduction

Chronic Non-Communicable Diseases (NCDs) stand out as one of the main causes of morbidity and mortality internationally. According to the World Health Organization (WHO), CNCDs directly impact human beings and affect the progress of the Millennium Development Goals, as their consequences can be felt in most countries, especially those with low and middle income and populations vulnerable. Among these, it is worth mentioning Diabetes Mellitus (DM) [1,2].

Worldwide, DM is considered a major public health impact, being commonly classified into three conditions: Type 1 Diabetes Mellitus (DM 1), Type 2 Diabetes Mellitus (DM 2) and Gestational Diabetes Mellitus (GDM). DM 2, or insulin-independent, is the most prevalent, comprising about 85% to 95% of cases. It is characterized by resistance to the hormone insulin, causing a deficiency in its action, and its main cause is related to lifestyle. With the increasing technological and industrial advancement in contemporary times, the way of living has been changing and contributing to the prevalence of physical inactivity, which is an important issue to be addressed [2].

Therefore, for the treatment of DM2 it is worth emphasizing the change in behavior. Therefore, physical activity is able to play a relevant role in the quality of life of diabetics and, therefore, it must be performed systematically and guided by a physical education professional. Therefore, the present work is relevant with regard to health research and education, promoting the dissemination of scientific evidence and strategies for the adoption of a healthy lifestyle [3].

This study aimed to identify, in the scientific literature, the impacts of lack of physical activity on the propensity for type 2 Diabetes Mellitus.

### Methods

This is an integrative review based on the databases of the CAPES Journal Portal and the Virtual Health Library (VHL), which were CINAHL, SCOPUS and Web of Science and BDNF, LILACS and MEDLINE, respectively. For this purpose, we crossed the health sciences descriptors “Motor Activity”, “Sedentary Behavior”, “Diabetes Mellitus”, “Diabetes Mellitus Type 2” and “Exercise”, associated with the Boolean operator *AND*.

Therefore, it was observed the need to adopt the systematization of the steps in six phases described: 1) Definition of the theme to be addressed and the guiding question to guide the research carried out; 2) Establishment of inclusion and exclusion criteria to be used; 3) Determination of the databases to be used for the development of article searches; 4) Analysis of the studies included in the qualitative synthesis; 5) Verification and Interpretation of the findings obtained; 6) Presentation of the approach to the theme of work3.

Thus, studies available in full, in Portuguese, English and Spanish, from 2015 to 2020, were used as inclusion criteria, in order to analyze current and international research. Duplicates, theses and studies not consistent with the purpose of this work were excluded. Therefore, 3,491 studies were obtained, which decreased to 1,376, and from these, the summaries of those that were in tune with the theme

were carefully read. The pre-selected articles were read in full, with 11 being chosen for the final sample.

## Results and Discussion

It was evident that physical activity contributes to body definition and physical resistance. Its absence contributes to the deficit in quality of life and to the increased risk of chronic diseases, stress and anxiety [4]. In this sense, despite the benefits of physical activity, there is a difficulty for the diabetic population to adhere to this practice, due to causes multifactorial, but largely related to the individual's own decision [5]. In addition, the concepts of sedentary lifestyle and physical inactivity differ, as it is possible for an individual to practice formal physical activity and still be included in the sedentary group, if they remain seated for long periods. Emphasizing that both terms imply negative health consequences [6,7].

Individuals classified as pre-diabetic are more likely to develop DM2, but this is not a rule and pointing out that a change in lifestyle is essential to prevent the progression of the disease [8]. In this same context, another study analyzed presented in its review studies that point to the positive effects of high-intensity physical activity, associating resistance and aerobics, on glycemic control [9].

Furthermore, low or absent physical activity is directly related to reduced energy expenditure, contributing to overweight and obesity and, consequently, increasing metabolic risk factors and the likelihood of being affected by cardiovascular and chronic diseases, including DM, especially DM 2 [6,10,11]. This inactivity can impact cardiovascular fitness, insulin resistance and glucose imbalance in the bloodstream, in addition to predisposing also to the complications of DM 2 and, thus, the lack of physical activity is strictly related to the propensity to trigger this type of diabetes [9,12,13].

In parallel to the results, a study found that the benefits and effects of physical activity for the individual with DM2 can be observed right at the beginning of the practice, so that it can increase the use of glucose by the muscle by about 20 times, promoting insulin sensitivity and reducing blood glucose levels to reach the normal range. Therefore, its absence impacts extremely negatively [1]. Thus, during resistance training, there is an increase in the amount of glucose in the body, preventing hypoglycemia, and it is essential that it be performed before aerobic exercise. In contrast, the absence of these practices can contribute to blood glucose decompensation [14].

Accordingly, almost half of the Brazilian population is insufficiently active, explaining the growing number of

cases of diabetics, and that the prevalence is among women [15]. Furthermore, it is worth noting that sports activities are not being properly encouraged and prescribed by health professionals, with the need to develop strategies to encourage the practice to prevent and treat DM2 [14]. Another point that must be emphasized is the fact that the prescription of physical training is unique, focused on the subject and his clinical needs. In cases of patients who already have DM 2, insulin dependence is higher in inactive individuals when compared to physically active individuals [16].

## Conclusion

In the meantime, it is concluded that physical activities, in addition to generating a better life expectancy and quality of life, contribute to the prevention of various health problems, making it possible to maintain a healthy functional capacity. However, despite the countless benefits of physical activity, it appears that only a small percentage of the population practices it, contributing negatively to the emergence of diseases, and the role of health professionals and authorities is essential.

Furthermore, the scarcity of the approach to the theme in current scientific production is highlighted, highlighting the need to update and/or innovate the research that surrounds this theme and discuss the necessary and effective measures to reverse the problem related to the insufficient practice of physical activities. In addition, it is essential that the issue be reinforced in the context of health education focusing on the reduction of CNCDs, especially DM2.

**Keywords:** Motor Activity. Sedentary Behavior. Diabetes Mellitus. Type 2 Diabetes Mellitus. Physical exercise.

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## Data sharing statement

No additional data are available.

## Conflict of interest

The authors declare no conflict of interest.

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